



**E444**

### **Algae as an Alternative Protein Supplement**

Abubakar Saleh Ahmad ; Munkhnasan Enkhbold ; Arijit Nath

Institute of Bioengineering and Process Engineering, Hungarian University of Agriculture and Life Sciences

The World's population and the rate of urbanization are rapidly increasing over the years, while the availability of land and resources for agriculture are becoming scanty. Moreover, there is interest in vegan food and ethical issues associated with the consumption of animal-based food in many parts of the world. Therefore, there is a concern to explore alternative sources of protein to meet the demand in the present and future scenarios. Production of proteins from algae can be considered a holistic approach because algae can capture atmospheric carbon-dioxide and produce oxygen, able to grow in a waste aquatic field with limited resources and inputs. Algae have a high growth rate and provide a higher yield compared to landfill plants. Moreover, algal proteins have high nutritional value in terms of the composition of amino acid and their digestibility. They have similar functional properties with other animal and plant-based proteins, like emulsifying capacity, water holding capacity, fat absorption capacity, and foaming capacity. Among the most important and widely cultivated commercial red algae, Nori (*Porphyra*), Dulse (*Palmaria palmata*) are used for food. Some green algae, *Chlorella*, *Monostroma*, and *Ulva lactuca*, and blue-green algae such as *Spirulina* are used for edible purposes. Among brown algae, *Laminaria*, *Undaria pinnatifida*, and *Hizikia* are used for edible purposes. Proteins from algae can be obtained by several methods. These include pretreatment by mechanical, chemical, and enzyme-based pretreatment, solvent extraction, and isolation of proteins by ultrafiltration or chromatographic techniques. Several investigations have been carried out about the development of a suitable strategy for the cultivation of algae and the production of algal protein. In the present review, comprehensive information about the cultivation of algae and the production of algal protein are represented.